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Attorneys for Defendant
GOOGLE INC.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.,

Plaintiff,

v.

GOOGLE INC.,

Defendant.

Case No. 3:10-cv-03561 WHA

DECLARATION OF MARK H. FRANCIS IN SUPPORT OF DEFENDANT GOOGLE INC.'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

I, Mark H. Francis, declare as follows:

I am an associate in the law firm of King & Spalding LLP, counsel to Google Inc. in the present case. I submit this declaration in support of Defendant Google Inc.'s Motion for Leave to Supplement Invalidity Contentions. I make this declaration based on my own personal knowledge. If called as a witness, I could and would testify competently to the matters set forth herein.

1. Both before and after serving its Invalidity Contentions, Google sought out new bases for invalidity.

2. A number of attorneys, general researchers, experts, and commercial search firms participated in Google's search to identify many thousands of potentially relevant prior art publications.

3. All such prior art publications were reviewed by an individual with a background in software programming and determined to be relevant to one or more of the patents-in-suit.

4. Google's prior art search encompassed a wide variety of sources and techniques to identify prior art dating back to the 1960's, including searching on commercial and publicly-available electronic databases such as Google Scholar, the Patent Office's patent database, the Institute for Electrical and Electronics Engineers (IEEE) database, the Association for Computing Machinery (ACM) database, and electronic catalogs provided by a number of public and private universities with extensive print collections of programming and systems materials.

5. Much of this searching was based on a manual identification and review of these prior art materials.

6. One search technique employed to locate prior art was the use of bibliographies to perform forward and reverse citation searches on many of the relevant publications.

7. For many of the older prior art publications, citation searching required manual adjustment of search criteria due to inconsistencies in citation formats.

8. Review of electronic materials and conversations with experts in the field identified a number of potential prior art systems and materials that were not easily accessible through traditional search engines.

9. Google's searchers manually reviewed extensive collections of prior art materials relating to Multics, IBM System 360, and other systems dating back to the 1960's.

10. Many of these older prior art documents were not indexed or easily searchable.

11. Some of the identified prior art documentation was only available from individuals' personal collections.

12. Once located, many such prior art documents were difficult to understand without first learning about the particular computer platforms they discussed.

13. Each of these older prior art systems had its own distinctive terminology and many had system architectures foreign to all but experienced computer programmers and researchers.

14. Google's attorneys and experts examined a number of physical prior art documents in university libraries across the country looking for relevant material in textbooks, conference proceedings, dissertations, and product documentation.

15. Google's attorneys also searched through various websites (eBay.com, abebooks.com and others) and purchased prior art textbooks and product documentation that contained prior art or identified other relevant publications or products.

16. Google has also conducted searches of Oracle's massive document production to identify relevant prior art material, but the voluminous nature of that production, combined with limited available metadata and search context, lack of searchable text, and disorganized dump of the production, has made searching difficult and time consuming.

17. Google has expended over fifteen hundred hours person hours in the search process, involving over fifteen individuals, including technical consultants and experts.

18. The *Tafvelin* reference was discovered in April 2011, the *Daley* reference was discovered in April 2011, and the *Vyssotsky* reference was discovered in June 2011.

19. Attached to this declaration as Exhibit A is a true and correct copy of Oracle's Supplemental Response to Google Interrogatory No. 13 (dated April 25, 2011), stating that the inventors' documents had been destroyed ("Oracle no longer has custodial data for the following people because they left employment at Sun Microsystems some time ago and their data was removed from Sun's systems pursuant to Sun's policies: Lars Bak … Nedim Fresko, Robert Griesemer, … Li Gong, … Richard Tuck, …Frank Yellin.") (highlights added).

20. Attached to this declaration as Exhibit B is a true and correct copy of an excerpt from the transcript of the April 14, 2011 deposition of Lisa J. Ripley acknowledging that the inventors' documents had been destroyed (highlights added).

21. Attached to this declaration as Exhibit C is a true and correct copy of a letter from Oracle to Google on June 22, 2011, stating that Oracle "recently identified" documents associated with two of the named inventors.

22. Attached to this declaration as Exhibit D is a true and correct copy of a letter from Google to Oracle on May 3, 2011 asking for consent to file an unopposed motion for leave.

23. Attached to this declaration as Exhibit E is a true and correct copy of a letter from Oracle to Google on May 3, 2011 declining to consent to a motion for leave and demanding "an identification of the new prior art references and an explanation of the grounds for good cause to amend."

24. Attached to this declaration as Exhibit F is a true and correct copy of a letter from Google to Oracle on May 6, 2011 outlining its good cause to supplement.

25. Attached to this declaration as Exhibit G is a true and correct copy of an e-mail from Google to Oracle on May 16, 2011 enclosing a draft of Google's supplemental invalidity contentions and supporting exhibits.

26. Attached to this declaration as Exhibit H is a true and correct copy of a

letter from Google to Oracle on May 25 2011, memorializing Mr. Peters', counsel for Oracle, concession that Oracle was not prejudiced by Google's supplemental invalidity contentions.

27. Attached to this declaration as Exhibit I is a true and correct copy of a letter from Oracle to Google on May 31, 2011, refusing to consent to an unopposed motion for leave, but not disputing Mr. Peters' concession at the meet-and-confer.

28. Attached to this declaration as Exhibit J is a true and correct copy of an excerpt from B. Ramakrishna Rau, LEVELS OF REPRESENTATION OF PROGRAMS AND THE ARCHITECTURE OF UNIVERSAL HOST MACHINES, Coordinated Science Laboratory, University of Illinois (1978) ("*Rau*") (highlights added), as produced to Oracle in this case.

29. Attached to this declaration as Exhibit K is a true and correct copy of an excerpt from Oracle's Second Supplemental Infringement Contentions, alleging that JavaOS 1.0 practices the invention claimed in the '702 patent (highlights added).

30. Attached to this declaration as Exhibit L is a true and correct copy of a May 29, 1996 press release from JavaSoft, a subsidiary of Oracle (then named Sun Microsystems Inc.), announcing the release of JavaOS more than a year before the October 31, 1997 filing date of the application which issued as the '702 patent, *available at* http://web.archive.org/web/19961220110704/http://www.sun.com/smi/Press/sunflash/9605/sunflash.960529.11819.html.

31. Attached to this declaration as Exhibit M is a true and correct copy of a letter from Oracle to Google on July 6, 2011 claiming that its identification of a prior art version of JavaOS as practicing the patent was "in error" and attempting to amend its infringement contentions without leave of the Court. All references to material subject to the "HIGHLY CONFIDENTIAL – SOURCE CODE" designation have been redacted or omitted.

32. Attached to this declaration as Exhibit N is a true and correct copy of an excerpt from Google's January 2011 Invalidity Contentions (highlight added).

33. Attached to this declaration as Exhibit O is a true and correct copy of an excerpt from Li Gong et al., GOING BEYOND THE SANDBOX: AN OVERVIEW OF THE NEW SECURITY ARCHITECTURE IN THE JAVA DEVELOPMENT KIT 1.2, USENIX Symposium on Internet Technologies and Systems (December 8-11, 1997) ("*Gong*") (highlights added), as produced to Oracle in this case.

I declare under penalty of perjury that the foregoing facts are true and correct.

Executed on July 8, 2011 in New York, New York.

/s/ Mark H. Francis /s/
Mark H. Francis

I hereby attest that Mark H. Francis concurs in the e-filing of this document.

/s/ Cheryl A. Sabnis /s/

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit A

PROPOUNDING PARTY: Defendant Google Inc.

RESPONDING PARTY: Plaintiff Oracle America, Inc.

SET NO.: Three (Interrogatory 13)

Pursuant to Rules 26 and 33 of Federal Rules of Civil Procedure, Plaintiff Oracle America, Inc. ("Oracle") hereby submits the following supplemental response and objections to Defendant Google Inc.'s ("Google") Third Set of Interrogatories.

INTERROGATORY NO. 13:

Describe with particularity any Documents that Oracle has a reasonable belief were at one time in the possession, custody, or control of Sun or Oracle and that would be responsive to any of Google's Requests for Production of Documents but that are no longer in the possession, custody, or control of Oracle and explain, with specificity, why each such Document is no longer in Oracle's possession, custody, or control.

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 13:

Oracle objects to this Interrogatory to the extent it seeks information (e.g., descriptions of documents) protected by the attorney-client privilege, the work product doctrine, the common interest privilege, and/or any other applicable privilege, immunity, or protection.

Subject to the foregoing objection, Oracle responds: Oracle is not aware of any specific responsive documents that were at one time, but are no longer, in Oracle's possession, custody or control. As described below, data and documents belonging to certain identified Oracle and Sun Microsystems custodians are no longer in Oracle's possession:

- Data from the computer of Oracle employee Vineet Gupta was lost when Mr. Gupta's computer was stolen in 2008.
- Oracle no longer has custodial data for the following people because they left employment at Sun Microsystems some time ago and their data was removed from Sun's systems pursuant to Sun's policies: Lars Bak, Manoharan Balasubramaniam, David Brownell, Danese Cooper, Alan Brenner, Graham Hamilton, Vincent Hardy, Kathleen Knopoff, Anil Vijendran, Nedim Fresko, Robert Griesemer, William (Bill)

Joy, Li Gong, Peter Lord, Shannon Lynch, David P. Stoutamire, Omar Tazi, Laurie Tolson, Richard Tuck, Kenneth Urquhart, Frank Yellin.

Dated: April 25, 2011

MICHAEL A. JACOBS
MARC DAVID PETERS
DANIEL P. MUINO
MORRISON & FOERSTER LLP

By: /s/ Marc David Peters

Attorneys for Plaintiff
ORACLE AMERICA, INC.

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit B

A. Well, in this case, it would be -- I would be researching the home directory server, the file server, or the mail server.
Q. And did you determine that the servers had been end-of-lifed?
A. I don't recall specifically in regards to her. There's over, I think, 250 custodians on this case, I could not go line-by-line and tell you -- I mean, obviously we're tracking it internally, but I can't tell you right here sitting here more specifically as to her data.
Q. Okay. Well, these are the inventors and they're also people that Oracle has made an affirmative statement in response to Request For Productions that Oracle does not have custodial data for these individuals. And so is there anyone other than you who could explain in more detail the steps that were taken to support these statements?
A. No, because I did the work, and what I can tell you, if you're speaking to the inventors, I was given the names, I went out and researched what servers their data had resided on, and for the majority of them, they'd been gone too long, and the servers were gone. But I verified the servers didn't exist any longer, and if a server happened to still exist, which I think that

may have been one, maybe two people that a server still existed, I went head and searched those servers to make sure the data wasn't still there.
Q. And sitting here today, you can't tell me for any of the inventors, which are Li Gong, Frank Yellin, Lars Bak, Robert Griesemer, Nedim Fresko, which specific servers you're talking about?
A. Not off the top of my head.
Q. Are you aware of an interrogatory that was served relating to document preservation?
A. I've -- there's been multiple interrogatories that have been discussed, but I can't recall. You know, I can't speak to the specific interrogatory.
Q. Did you review any interrogatories in preparation for this litigation, I mean this deposition?
A. Interrogatories? No. As I've already testified, I'm involved in ongoing meetings discussing requests for different materials, and so interrogatories are discussed.
Q. So what records exist that would reflect the end-of-lifing of the servers you referred to earlier as well as the -- well, let's start there. What records exist that would reflect the end-of-lifing of the servers you referred to in responses to your inventors' custodial data?

A. I'm not sure there would be records. A lot of this is based on my memory and just knowledge of the infrastructure because based on my past history of employment at Sun, I was involved in system administration of systems that supported our infrastructure. But as I've testified, I've made the effort to go out and try to essentially connect to those systems to verify they're not in existence.
Q. Is there any formal documentation of the end of life of servers?
A. Perhaps in our past history, there were project plans, but obviously with the acquisition, we've gone -- undergone a lot of changeover, and I could not speak to specifics as to what's still retained.
Q. And would you have the same answer -- well, I'll just ask it: What records exist that would reflect the destruction of specific archive tapes?
A. Our -- I don't know of specific documentation prior to 2007.
Q. Do you know -- well, were you asked to look into custodial data for Oracle employees that were never at Sun?
A. No, I was not personally.
Q. And do you know who would have been asked similar questions as you were to the -- to the inventors

for people who were at Oracle with respect to whether their data was still available?
A. I'm sorry, can you repeat your question? I didn't catch your train of thought on that.
Q. If there was a similar situation as to identifying whether custodial data existed, but it was an Oracle employee and not a prior Sun employee, do you know who that inquiry would have been directed at?
A. So normally the legal assistant or paralegal for the case contacts Oracle IT.
Q. And in preparation for this deposition, did you discuss any situations where Oracle employee custodial data might not still be available with anyone who would have been responsible for that inquiry?
A. Not spoke to anyone specifically, but as part of my integration into Oracle, I'm aware of their -- to some degree of their processes, and as such, know that they are similar to us in that former employee data is available for a limited amount of time unless it's on legal hold, and then it's removed as part of normal business operations.
(Exhibits Google 9 and 10 marked.)
MR. SNYDER: Introduced as Google Exhibit 9, a document entitled "Policies, Procedures and Guidelines," and it's stamped OAGOOGLE0000062856 to 857.

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Q. Would that document be provided to all employees?
A. Yes.
Q. And do you have an understanding as to what's meant in the first bolded sentence on the cover page or the first bolded clause, "unless the records have a current business purpose"?
A. Basically if you need it still for your ongoing daily business tasks.
Q. So the understanding of that whole sentence is that it's suggesting that the records shouldn't be retained unless you're currently using them for a business task or they're subject to a legal hold?
A. Correct.
Q. And we discussed litigation holds earlier. Are you personally aware of when the first litigation hold was put in place for this litigation?
A. No. As I've previously testified, I don't know any specific dates, just that holds were issued prior to the claim being filed.
Q. Do you know how Oracle treats Sun's documents with respect to retention? And by that, the question is does Oracle continue to use Sun's policy for those documents or did they recategorize them under Oracle's policy?

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A. They're being recategorized under Oracle's policy, with the exception obviously if things are on legal hold.
Q. And is that process still ongoing?
A. It is.
Q. So if you -- let's go back to Exhibit 10. At page 63194 and under Retention Code 07102, do you see that it says, "Records related to domestic patents and products and processes held by Sun, including those products developed by Sun personnel on company time, includes patent registration and related correspondence"?
A. I do.
Q. And that the retention is seven years?
A. I see that.
Q. And it says, "Retention begins when the patent has expired"?
A. I see that.
Q. Do you have any understanding of whether related correspondence would include email correspondence from inventors?
A. At Sun, email itself was not considered a record. It would be the contents of an email that could potentially be a record, and that's why they say to refer to the retention schedule to determine if some content of an email would be considered a record and needed to be

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preserved or retained.
Q. And who would have been responsible for doing that?
A. The individual employees or the line of business.
Q. And if someone identified something under this that needed to be retained, it wouldn't necessarily be considered a permanent record, would it?
A. If it falls into one of these retention schedules, yes, then it's considered a permanent record is supposed to be preserved off-site at Iron Mountain.
Q. So anything that was -- fell into this category should have been printed and retained in hard copy?
A. If it was deemed to be a permanent record, yes.
Q. Well, that's what I'm trying to get at. Let me go back to what it says.
A. Okay.
Q. Is it automatically deemed a permanent record if it falls in this category?
A. (No audible response.)
Q. I'll strike that previous question.
I want to re -- if we go back to Exhibit 9, there's two things. One, it says: "If an email message

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is considered a permanent record, it should be printed and stored in hard copy format," and it refers to a general retention schedule to determine if it is designated as a permanent record. But it also refers in the very last sentence to the general retention schedule to determine if messages need to be retained.
Is there a difference between documents that just need to be retained versus ones that are permanent records?
A. Yes, because you could have something that's on legal hold that's not considered a permanent record, that has to be retained, obviously, to comply with the legal hold.
Q. So looking at the -- if I look at the general retention schedule, I don't see any real distinct -- I don't see anywhere where it says certain documents are -- should be permanent records and some should simply be retained.
I guess, is -- is what you said earlier, that anything that -- an individual would identify as applying to, for instance, retention code 07102, would be a permanent record that they should then print out and store in hard copy format?
A. Well, I think one of the difficulties is this is an older document and this is a newer document

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit C

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Re: *Oracle America, Inc. v. Google Inc.* – Oracle Production

Dear Steve:

We recently identified certain source code and documents associated with Nedim Fresko and Richard Tuck. The source code, designated HIGHLY CONFIDENTIAL – SOURCE CODE, is currently available for inspection in the source code repository at our office. The documents are being processed and should be ready for production next week. We will supplement germane discovery responses to reflect this production of Fresko and Tuck materials.

Sincerely,

/s/ Jessica J. Tipton

Jessica J. Tipton

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit D

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May 3 2011

VIA E-MAIL

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Re: *Oracle America, Inc. v. Google Inc.*, No. 3:10-CV-03561-WHA (N.D. Cal.)

Dear Marc,

Google would like to move the Court for leave to supplement its Patent L.R. 3-3 Invalidity Contentions. Google has good cause to supplement in view of issues raised by Oracle during the course of discovery, Oracle's supplemental infringement contentions, newly discovered prior art references and new invalidity theories developed by Google after serving its initial Invalidity Contentions. Moreover, Google believes that supplementing its invalidity contentions is appropriate in view of the Court's instructions to the parties regarding their respective disclosures. *See, e.g.*, April 6, 2011 Transcript of Proceedings, Dkt. 110 at 7:19-20 ("you should err on the side of more disclosure and more answer, and not hide the ball").

Google may have good cause to supplement its contentions again after the Court's claim construction is finalized, but we would like to provide this initial supplementation to Oracle as soon as possible.

Please let us know if Oracle will agree to not oppose Google's motion for leave to supplement its invalidity contentions.

Sincerely,

/s/ Mark H. Francis
Mark H. Francis

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit E

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May 3, 2011

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Re: *Oracle America, Inc. v. Google Inc.*
Case No. 10-03561-WHA

Dear Mark:

When we discussed a possible amendment to Google's Invalidity Contentions four weeks ago at the April 6 in-person meet-and-confer in the Court's jury room, Oracle asked for an identification of the new prior art references and an explanation of the grounds for good cause to amend, such as an explanation of why the new art was not identified earlier. Your letter of today leaves us in the dark. Oracle still needs that information to evaluate Google's request.

Sincerely yours,

Marc David Peters

pa-1462416

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit F

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May 6, 2011

VIA E-MAIL

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Re: *Oracle America, Inc. v. Google Inc.*, No. 3:10-CV-03561-WHA (N.D. Cal.)

Dear Marc,

As a follow up to my May 2, 2011 letter to you, Google would like to immediately move the Court for leave to supplement its Patent L.R. 3-3 Invalidity Contentions and has good cause for doing so for at least the following reasons:

1. Oracle raised purported deficiencies with Google's Invalidity Contentions during the course of discovery. For example, on February 3, 2011, you sent Scott Weingaertner a letter requesting additional disclosures pertaining to Google's 35 U.S.C. §§ 101 and 112 arguments. Google believes that supplementation is warranted – and in fact directly requested by Oracle – and that this additional disclosure would enable the parties to address these invalidity issues more constructively as the case proceeds.

2. On February 25, 2011, Oracle responded to Google's Interrogatory No. 11 with a 55-page argument that the asserted patents are not invalid under 35 U.S.C. §§ 102 or 103 despite the prior art referenced in Google's Invalidity Contentions. In view of these allegations, Google believes that supplementation is warranted and that additional disclosure would enable the parties to address these invalidity issues more constructively as the case proceeds.

3. Oracle served Google with its First Supplemental Infringement Contentions on February 18, 2011 and its Second Supplemental Infringement Contentions on April 1, 2011. While Google's investigation of the factual information and legal theories introduced in these

supplementations is ongoing, the supplemental Invalidity Contentions are intended to address some of the issues raised in Oracle's supplemental infringement contentions.

4. Google continued in good faith to investigate potential prior art and invalidity positions after serving its Invalidity Contentions. In some instances, it discovered new prior art when preparing the *ex parte* and *inter parte* re-examination requests which were recently submitted to the patent office (copies of which were also provided to Oracle). In other instances, prior art initially referenced in connection with one of the asserted patents in the Invalidity Contentions was more recently determined to also be applicable to a different one of the asserted patents.

5. Supplemental invalidity positions have been developed by Google since serving its initial Invalidity Contentions, even with respect to prior art initially served upon Oracle, largely based on Oracle's interrogatory responses, Oracle's representations to the Court in its claim construction briefings, statements by Oracle's counsel at the April 6 and April 20 hearings regarding the patented technology, and the Court's tentative claim constructions.

The items below represent a summary of the additions and revisions prepared by Google, along with a brief description of some reasons for the supplementations:

- The supplemental Invalidity Contentions will provide additional disclosure regarding Google's invalidity positions under 35 U.S.C. § 101, addressing issues specifically raised by Oracle in its February letter;

- The supplemental Invalidity Contentions will provide additional disclosure regarding Google's invalidity positions under 35 U.S.C. § 112, addressing issues specifically raised by Oracle in its February letter;

- With respect to the '104 patent, the following charts were revised or added:
  - Exhibit A-1 (D. Gries, *Compiler Construction for Digital Computers*, John Wiley & Sons, Inc., 1971) was revised in view of Oracle interrogatory responses (*e.g.,* Google Interrogatory No. 11) and in view of the Court's tentative claim construction for *intermediate form (object) code*;
  - Exhibit A-6 (Applicants Admitted Prior Art as admitted in U.S. Patent No. RE 38,104) was added in view of Court's tentative claim constructions and statements that Oracle's counsel made on the record regarding the terms *resolving* and *storing*;
  - Exhibit A-7 (S. Tafvelin, "Dynamic Microprogramming and External Subroutine Calls in a Multics-Type Environment," BIT 15 (1975) *with* R.C. Daley & J.B. Dennis, "Virtual Memory, Processes, and Sharing in MULTICS," Communications of the ACM, Vol. 11, No. 5, 1968) is supplemental art discovered after serving Google's Invalidity Contentions and particularly added in view of Oracle's interrogatory responses (*e.g.,* Google Interrogatory No. 11) with respect to what constitutes "executable" code;

- Exhibit A-8 (B. Ramakrishna Rau, "Levels of Representation of Programs and the Architecture of Universal Host Machines," IEEE (1978)) is a supplemental invalidity chart based on previously produced art and particularly added in view of Oracle's interrogatory responses (*e.g.,* Google Interrogatory No. 11) with respect to what constitutes "executable" code;
- Exhibit A-9 (Applicants Admitted Prior Art as admitted in U.S. Patent No. RE 38,104, *in view of* B. Ramakrishna Rau, "Levels of Representation of Programs and the Architecture for Universal Host Machines," IEEE (1978)) is a supplemental invalidity chartbased on previously produced art and particularly added in view of Oracle's interrogatory responses (*e.g.,* Google Interrogatory No. 11) with respect to what constitutes "executable" code, and also added in view of Court's tentative claim constructions and statements that Oracle's counsel made on the record regarding *resolving* and *storing*;
- Exhibit A-10 (S. Tafvelin, "Dynamic Microprogramming and External Subroutine Calls in a Multics-Type Environment," BIT 15 (1975), *in view of* R.C. Daley & J.B. Dennis, "Virtual Memory, Processes, and Sharing in MULTICS," Communications of the ACM, Vol. 11, No. 5, 1968) is supplemental art discovered after serving Google's Invalidity Contentions and particularly added in view of Oracle's interrogatory responses (*e.g.,* Google Interrogatory No. 11) with respect to what constitutes "executable" code;
- Exhibit A-11 (Applicants Admitted Prior Art as admitted in U.S. Patent No. RE 38,104, *in view of* Richard G. Bratt, U.S. Patent No. 4,525,780 (issued Jun. 25, 1985)) is supplemental art discovered after serving Google's Invalidity Contentions and particularly added in view of Court's tentative claim constructions and statements that Oracle's counsel made on the record regarding the terms *resolving* and *storing*;
- Exhibit A-12 (*Gries*, *Davidson*, or *Tafvelin*, *view of Rau* or *Daley*) is supplemental art discovered after serving Google's Invalidity Contentions and particularly added in view of Court's tentative claim constructions and statements that Oracle's counsel made on the record regarding the terms *resolving* and *storing*, it was also added in view of Oracle's interrogatory responses (*e.g.,* Google Interrogatory No. 11) with respect to what constitutes "executable" code; and
- Exhibit A-13 (U.S. Pat. No. 5,367,685, issued on 11/22/1994 to Gosling) is a supplemental invalidity chart based partly on Court's tentative claim constructions and statements that Oracle's counsel made on the record regarding the terms *resolving* and *storing*.

- With respect to the '720 patent, the following charts were developed as part of Google's preparation for filing an *inter partes* patent reexamination request and is primarily based on newly discovered art and/or provides supplemental invalidity charts based on previously produced art:

- Exhibit C-5 (U.S. Patent No. 6,823,509, issued on 11/23/2004 to Alan Michael Webb & U.S. Patent Application Publication No. 2003/0088604, published on 5/8/2003 naming Norbert Kuck et al. as inventors & M. J. Bach, *The Design of the Unix Operating System*, Bell Telephone Labs., Inc. (1986));
- Exhibit C-6 (U.S. Patent No. 6,854,114, issued on 2/8/2005 to Harlan Sexton et al. & U.S. Patent No. 6,075,938, issued on 6/10/1998 to E. Bugnion et al.);
- Exhibit C-7 (U.S. Patent No. 6,854,114, issued on 2/8/2005 to Harlan Sexton et al. & U.S. Patent No. 6,330,709, issued on 12/11/2001 to M. Johnson et al.);
- Exhibit C-8 (Sriram Srinivasan, *Advanced Perl Programming*, O'Reilly & Associates, Inc. (1997) & M. J. Bach, *The Design of the Unix Operating System*, Bell Telephone Labs., Inc. (1986));
- Exhibit C-9 (J. Dike, "A user-mode port of the Linux kernel", Proceeding ALS'00 Proceedings of the 4th annual Linux Showcase & Conference - Volume 4, USENIX Association Berkeley, CA, USA (2000) & U. Steinberg, "Fiasco µ-Kernel User-Mode Port" Dresden University of Technology Institute of System Architecture (2002));
- Exhibit C-10 (U.S. Pat. No. 6,405,367, issued on 06/11/2002 to Bryant & M. J. Bach, *The Design of the Unix Operating System*, Bell Telephone Labs., Inc. (1986)); and
- Exhibit C-11 (U.S. Pat. No. 6,405,367, issued on 06/11/2002 to Bryant & U.S. Patent Application Publication No. 2004/0010787, published on 1/15/2004 naming E. Traut et. al. as inventors).

- With respect to the '520 patent, the following charts were revised or added:
  - Exhibit D-3 (B.T. Lewis et al., "Clarity MCode: A Retargetable Intermediate Representation for Compilation," ACM, IR '95, 1/95, San Francisco, California, USA, 1995) was supplemented to include inadvertently omitted claims 14 and 17 (according to Oracle's infringement contentions, these claims are essentially duplicates of claims 10 and 2, respectively, which were addressed in the original exhibit);
  - Exhibit D-5 (B.T. Lewis et al., "Clarity MCode: A Retargetable Intermediate Representation for Compilation," ACM, IR '95, 1/95, San Francisco, California, USA, 1995 & Gosling et al., *The Java™ Language Specification 1.0*, Sun Microsystems, Inc. (1996) & *The Java™ Virtual Machine Specification*, Sun Microsystems Computer Corp., Release 1.0 Beta DRAFT, (Aug. 21, 1995)) is a supplemental invalidity chart based on previously produced art and particularly added in view of Oracle's interrogatory responses (*e.g.*, Google Interrogatory No. 11); and
  - Exhibit D-6 (B.T. Lewis et al., "Clarity MCode: A Retargetable Intermediate Representation for Compilation," ACM, IR '95, 1/95, San Francisco, California, USA, 1995 & Dave Dyer, Java Decompilers

Compared, JavaWorld.com (July 1, 1997) & Proebsting et al., Toba: Java for Applications A Way Ahead of Time (WAT) Compiler, Proceedings of the Third USENIX Conference on Object-Oriented Technologies and Systems (1997)) is supplemental prior art discovered after serving Google's Invalidity Contentions in the course of preparing a re-examination request.

- With respect to the '205 patent, the following charts were added:
  - Exhibit E-9 (*Deutsch*, *Wakeling*, *Lewis*, *Yellin*, *Nilsen*, or *Hookway*, *in view of Tarau* or *Magnusson*) is a supplemental invalidity chart based on previously produced art, largely clarifying some of the § 103 invalidity combinations on which Google may rely, although all of the included references and disclosures were already disclosed in § 102 charts provided in Google's initial Invalidity Contentions.

Supplemental invalidity positions may yet be developed as Google's investigation continues with respect to invalidity and additional prior art may yet be discovered. In addition, Google expects that its invalidity positions may be further revised or supplemented in view of the Court's pending claim constructions and discovery from Oracle. Google will endeavor to timely provide any further disclosures to Oracle as they develop.

As noted in my May 3rd letter to you, the Court has strongly encouraged the parties to supplement their disclosures in view of any new information, or to address any alleged insufficiencies identified by the receiving party. This is exactly what Google is aiming to accomplish with these Supplemental Invalidity Contentions.

Please let us know if Oracle will agree to not oppose Google's motion for leave to supplement its Invalidity Contentions. Google would appreciate a timely response so we know if this issue needs to be raised with the Court in an opposed or unopposed manner.

Sincerely,

/s/ Mark H. Francis
Mark H. Francis

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit G

Mark Francis

From: Francis, Mark
Sent: Monday, May 16, 2011 7:58 PM
To: Marc D. Peters
Cc: Oracle-Google@bsfllp.com; Oracle MoFo Service List; Google-Oracle-OutsideCounsel; Deborah.Miller@oracle.com; Dorian.daley@oracle.com; Matthew.sarboraria@oracle.com
Subject: RE: Oracle America, Inc. v. Google Inc. - Correspondence to M. Peters
Attachments: 11 05 16 - GOOGLE First Supp Invalidity Contentions.pdf; Amd&SuppExhibits.zip

Marc,

Enclosed are Google's First Supplemental Invalidity Contentions, along with a zip file containing the amended and supplemental exhibits.

Best Regards,

Mark

Mark H. Francis
King & Spalding LLP
1185 Avenue of the Americas
New York, NY 10036
(212) 556-2117
(212) 556-2222 (fax)
mfrancis@kslaw.com

From: Peters, Marc D. [mailto:MDPeters@mofo.com]
Sent: Monday, May 16, 2011 1:56 AM
To: Francis, Mark
Cc: Oracle-Google@bsfllp.com; Oracle MoFo Service List; Google-Oracle-OutsideCounsel
Subject: RE: Oracle America, Inc. v. Google Inc. - Correspondence to M. Peters

Dear Mark,

Michael discussed this issue with Scott Friday morning in connection with the case management plan. Separate and apart from that, it would be helpful if you could send us any proposed charts that you have already prepared and a summary of the contentions for the other grounds (e.g., 101, 112). This would help us and our client evaluate Google's request.

Best regards,
Marc

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit H

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Mark H. Francis
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May 25, 2011

VIA E-MAIL

Marc D. Peters, Esq.
Morrison & Foerster LLP
755 Page Mill Road
Palo Alto, CA 94304-1018
mjacobs@mofo.com

Re: *Oracle America, Inc. v. Google Inc.*, No. 3:10-CV-03561-WHA (N.D. Cal.)

Dear Marc,

During the meet-and-confer call on May 23, 2011, we again asked for Oracle's consent to file an unopposed motion for leave to supplement Google's Invalidity Contentions. You agreed that there was no prejudice to Oracle as a result of these supplemental contentions, but indicated you would not provide us with Oracle's position until after the Court ruled on certain case management issues. The Court issued an Order on those case management issues that same day, yet we have not heard from you regarding Google's pending request.

Google has been requesting Oracle's non-opposition to a motion for leave to supplement since May 3, 2011 and Oracle has still not provided an answer. We have promptly responded to your many requests, including a detailed description of Google's good cause for supplementing its contentions (May 6, 2011), a complete copy of the Supplemental Invalidity Contentions and supporting exhibits (May 16, 2011), and even red-line versions illustrating all revisions from the original Invalidity Contentions (May 17, 2011). Your continued delay in responding to this request is disappointing because we expected Oracle to be cooperative on this straightforward issue. Please let us know if Oracle will consent to an unopposed motion by no later than the next meet-and-confer call, after which Google will file its motion – with or without consent.

Sincerely,

Mark H. Francis

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit I

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May 31, 2011

Writer's Direct Contact
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MDPeters@mofo.com

Via E-Mail mfrancis@kslaw.com

Mark H. Francis
King & Spalding LLP
1185 Avenue of the Americas
New York, NY 10036

Re: *Oracle America, Inc. v. Google Inc.*
Case No. 10-03561-WHA

Dear Mark:

We have had the chance to review your letter of May 6 regarding Google's desire to supplement its invalidity contentions. As I told you last week, we had not focused much on the issue of invalidity supplementation before then because we expected that the issue would have been rendered moot through the process of submitting plans to the Court regarding narrowing the issues for trial. As part of a compromise case plan, Oracle had offered to accept any supplementation that Google wanted to make, but Google declined that compromise, and here we are.

The trouble has with Google's proposed supplementation is that we do not see good cause for it, particularly since it so dramatically expands the case with new invalidity theories at a time when we are supposed to be refining and focusing the case.

Google seeks to add nineteen new prior art charts, almost tripling the number applying to the '104 patent alone and increasing the total number from thirty-five to fifty-four. Google seeks to add a host of new defenses, including section 101 and 112 defenses. Some of these theories are not well-developed. For example, Google's new best mode theories are made on "information and belief." Contentions are not supposed to be placeholders.

The supplemental invalidity theories that Google now desires to assert are ones that could have been made before, which means there is no good cause to amend. All of Google's new non-prior-art-based theories are based on information (the patents and file histories) that were in Google's possession at the outset of the case. Almost all of the "new" art was in Google's possession when it prepared its January contentions, as demonstrated by the long list of uncharted references in that document. Oracle's interrogatory response pointing out

the defects in Google's invalidity theories does not provide "good cause" to amend either—that just leads to the "shifting sands" approach that the patent local rules are supposed to eliminate. We asked for additional information on certain defenses in February but, despite Google's apparent willingness to supply it then, when we asked for a date certain for that supplementation, Google declined. The touchstone of good cause to amend is diligence, and Google just hasn't shown diligence in developing its new theories.

We don't see the new invalidity theories as playing any important role in the case. For example, Google now wants to contend that the '104 claims are anticipated by their own specification (chart A-13). That's certainly a novel argument, but one not likely to succeed (not to mention being directly contradicted by Google's desire to contend that that same specification fails to provide an enabling written description of those same claims). Nor is the new "failure to pay proper application fees" theory Google's strongest one.

I write not to make sport of Google's creativity, but to point out that Google's proposed supplementation is a "kitchen sink" document, containing every possible invalidity theory that Google has thought of, regardless of its relative merit. Under the circumstances, given the clear direction we both have received from the Court about narrowing the case to a manageable size, Google's proposal is a large step in the wrong direction. While Oracle can agree to the corrections in the D-3 chart, as I've mentioned before, Oracle cannot agree at this point to expand the case with a slew of new invalidity theories.

Sincerely yours,

Marc David Peters

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit J

LEVELS OF REPRESENTATION OF PROGRAMS AND THE ARCHITECTURE OF UNIVERSAL HOST MACHINES

B. Ramakrishna Rau

Coordinated Science Laboratory
University of Illinois, Urbana, IL 61801

Summary

The issue of high level language support is treated in a systematic top-down manner. Program representations are categorized into three classes with respect to a host processor: high level representations, directly interpretable representations and directly executable representations. The space of intermediate languages for high level language support is explored and it is shown that whereas the ideal intermediate language from the point of view of execution time is a directly executable one, the best candidate from the viewpoint of memory requirements is a heavily encoded directly interpretable representation. The concept of dynamic translation is advanced as a means for achieving both goals simultaneously; the program is present in the memory in a compact static representation, but its working set is maintained in a dynamic representation which minimizes execution time. The architecture and organization of a universal host machine, incorporating this strategy, is outlined and the potential performance gains due to dynamic translation are studied.

1. Introduction

1.1. Microprogramming and Interpretation

Microprogramming was originally conceived by Wilkes as a systematic means of implementing the control structure of a computer[1]. The microprogram, embedded in a read-only memory, interprets the instruction set visible to the programmer. In view of the permanence of the microprogram and its transparency to the user, the interpreted instruction set was, reasonable enough, thought of as representing the architecture of the machine. Accordingly, the emphasis was on the interpreted instruction set.

With the advent of writeable control store, the situation has changed and, yet, the perspective has remained much the same. Writeable control store is viewed as a means of providing a "soft architecture," i.e., one that can be changed dynamically to match the needs of the moment which might, for instance, entail the support of a high level language. Experience with the Burroughs B1700[2,3] and the work of Hoevel[4] has demonstrated the effectiveness of such a strategy. However, the emphasis still is on the interpreted instruction set. An artificial line is drawn upon which lies the conventional machine language. On one side of this line is the domain of high level languages, compilers, interpreters and main memory. On the other side lie the microprograms, nanoprograms, emulators and a host of other micro- and nano- entities. This viewpoint arises, in part, from the use of microprogrammable machines predominantly for the purpose of emulating the instruction sets of other machines. This classical concept of microprogramming tends to obfuscate the issue which may be phrased as follows: given a certain (open ended) set of high level languages, what is the nature of the host hardware that is best suited to supporting them and what is the process by which programs, written in these high level languages, are supported? A fresh perspective can be valuable; the host machine should be viewed as a special purpose machine designed to provide high level language support. The architecture and organization should evolve as the outcome of a top-down design process rather than as a carry-over from the classical view of microprogramming. This is the objective of this paper and so as to avoid any preconceived notions, the terminology of microprogramming is avoided as far as is possible.

The architecture and instruction set of a host is determined by the class of languages that are to be supported by it. If this class is restricted and consists of similar languages, the application of the host is fairly specific and the instruction set will contain powerful instructions which closely resemble the semantics of the high-level languages that are supported by the host. Several examples of high-level machine designs fall into this category[5-10]. On the other hand, if the class of languages is large and vague, commonality of semantics will exist only at a very low level and the instruction set of the host machine will be primitive. This provides generality and flexibility. A host of this type is termed a universal host machine (UHM). A number of examples of UHM's are available[2,11-14].

Given a host architecture and a high level language, one could either interpret the latter directly, compile it into the machine language or compile it into an intermediate language which is then interpreted. Hoevel derives conditions under which the last alternative is superior to the other two[15]. These conditions are generally satisfied for the types of universal host architectures that exist or are under consideration.

CH1411-8/78/0000-0067$00.75

interpreter must complete whatever binding remains. However, this binding persists only over the period of execution of an instruction and must be repeated each time that instruction is executed. From the point of view of persistence of binding, the compiler and interpreter are at opposite extremes. We introduce the notion of a dynamic translator, the persistence of whose binding lies in between that of the compiler and the interpreter. Once the dynamic translator binds an instruction (totally or partially), it remains bound over a period of time that spans a certain number of successive executions of that instruction. Such a strategy assumes, of course, that the program is not self-modifying -- an assumption that is valid when programs are written in high-level languages.

One could conceive of a hierarchy of representations each with a different level of binding and degree of persistence: the source program which exists until destroyed, the DIR which lasts until the source is modified, the link-edited version which exists for one execution of the program, possibly a number of lower levels, each increasingly bound and persisting for decreasing fractions of the program execution period and, finally, a completely bound representation of an instruction which only lasts for the duration of that instruction's execution.

The significance of the dynamic translator is that it raises the possibility of simultaneously achieving high speed interpretation and a compact static intermediate representation. Since the binding performed by a dynamic translator persists over a number of executions of an instruction, the time spent in binding is spread out over those instructions, thereby reducing the average time spent in binding per instruction executed. It is possible then to use a highly encoded DIR without increasing the interpretation time by very much if the binding is made to persist over a sufficient number of successive executions of the same instruction. This persistence of binding is effected by saving the bound representation of the instruction which will be less compact than the encoded DIR version. Attempting to retain this bound version for extended periods of time for a number of different instructions will entail the use of large amounts of memory. In fact, if the bound version were never discarded, one would soon obtain and have to provide storage for a translated version of the entire program, thereby defeating the purpose of using an encoded DIR.

The effectiveness of the dynamic translator hinges on the ability to save the bound representation for just a short period of time which, nevertheless, spans a large number of executions of the instruction. The existence of loops and recursive calls implies this ability. In fact, the more general "principle of locality" states that over any interval of time, the vast majority of memory references are concentrated on a small subset of the address space. This principle has been empirically validated over and again[26-28] and is the fundamental justification for the existence of cache memories[28-30] and virtual memories.[31,32] The fraction of the address space that is currently being referenced heavily is termed the working set.[27] The function of the dynamic translator is to maintain in the dynamic translation buffer (DTB) a representation of the instruction working set that is more tightly bound than the static representation. If the size of the DTB is reasonably large and if the contents of the DTB are selected carefully, it is possible to ensure that a large fraction of all instructions executed will be present in the DTB. This fraction is termed the hit ratio. When the hit ratio is close to unity, most instructions when executed will be found in the more tightly bound representation. The time penalty associated with binding will be experienced only rarely and will not be a major factor in determining the execution time. If, at the same time, the size of the DTB is small in comparison to the size of the loosely bound representation, the memory requirements will not have been increased substantially and the conflicting requirements of a compact representation and low execution time will be met simultaneously.

The concept of a DTB is related to that of the dynamic address translation mechanism provided with virtual memories. When addressing a virtual memory, the virtual address must be bound to a physical address. This involves indirection through one or more segment and page tables on each memory reference. This overhead is reduced by retaining in an associative array the mapping between the virtual and physical addresses for the pages which have been referenced most recently. The DTB may be viewed as a cache on a virtual memory in which the program is stored in the more tightly bound representation.

When the dissimilarities between the representations corresponding to minimum execution time and minimum storage requirements, respectively, are great, it is possible that a number of levels of dynamic translation will be required. However, in the rest of this paper, we shall concern ourselves with only one level of dynamic translation. Typically, three different representations are of interest: the HLR in which the program is written, the static (intermediate) representation into which it is compiled and the dynamic representation which is obtained by dynamically translating the static representation of the working set. Of these, only the latter two will be in the directly addressable memory during execution.

The use of dynamic translation permits the decoupling of the design decisions involved in selecting the intermediate representation. The static representation may be selected solely to minimize the size of the program. Ideally, it should be a high level, highly encoded DIR. The dynamic representation, on the other hand, should be selected to speed up execution and should, ideally, be a high level P-DER.

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit K

- MIDP 1.0 and subsequent versions.

2. The ’205 Patent

The following instrumentalities of Oracle practice the asserted claims of the ’205 patent:

- JDK 1.2 and subsequent versions;
- JRE 1.2 and subsequent versions;
- HotSpot 1.0 and subsequent versions;
- Java SE for Embedded 1.4.2 and subsequent versions;
- CDC RI 1.0.1 and CDC-HI 1.0 and subsequent versions of each;
- CDC AMS 1.0, 1.0_1, 1.0_2, Personal Basis and Personal Profile versions;
- CLDC RI 1.1.1;
- CLDC-HI 1.0 and subsequent versions;
- Foundation Profile 1.0.2 and subsequent versions;
- J2EE 1.2 (later called Java EE) and subsequent versions;
- Java ME SDK 3.0 EA and subsequent versions;
- Java Real-Time System 1.0 and all subsequent versions;
- Personal Profile HI and RI 1.0 and subsequent versions; and
- Personal Basis Profile HI and RI 1.0 and subsequent versions.

3. The ’702 Patent

The following instrumentalities of Oracle practice the asserted claims of the ’702 patent:

- PersonalJava (“PJava”) 1.0 and subsequent versions;
- EmbeddedJava (“EJava”) 1.0 and subsequent versions;
- JavaOS 1.0 (and all variants, including Java PC) and subsequent versions;
- CDC RI 1.0 and CDC-HI 1.0, and all subsequent versions of each;
- CDC AMS 1.0, 1.0_1, 1.0_2, Personal Basis and Personal Profile versions;
- CLDC RI 1.1.1 and CLDC-HI 1.0.1, and all subsequent versions of each;
- Personal Profile HI and RI 1.0 and subsequent versions;
- Personal Basis Profile HI and RI 1.0 and subsequent versions;
- Foundation Profile 1.0 and subsequent versions; and

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit L

JAVASOFT ANNOUNCES JavaOS

Companies endorse JavaOS in desktop, consumer and embedded environments

Industry leaders to provide development tools, applications

San Francisco, CA - May 29, 1996 - JavaSoft, an operating company of Sun Microsystems, Inc. (NASDAQ:SUNW) today announced "JavaOS"(TM), a highly compact operating system designed to run Java applications directly on microprocessors in anything from net computers to pagers.

In related news, several industry leaders today announced that they intend to license JavaOS. Additionally, several leading software companies announced their intention to provide development tools for JavaOS.

A dynamically extensible operating environment, JavaOS brings the design advantages of the Java(TM) programming language to an operating system. As perhaps the smallest and fastest OS that runs Java, JavaOS enables Java on a broad range of devices. JavaOS will run equally well on a network computer, a PDA, a printer, a game machine, cellular telephone, or countless other devices that require a very compact OS and the ability to run Java.

"JavaOS is elegantly simple and extremely powerful at the same time. It was designed with a single purpose -- to be just enough OS of just the right kind to run the Java Virtual Machine(TM), which brings Java to a huge new range of electronic appliances," said Jim Mitchell, CTO, JavaSoft. "No other software platform has the reach that JavaOS provides for Java."

Industry endorses JavaOS

To date, Acer Inc., Acer Peripherals Inc., Alcatel Business Systems, Axil Computers, ETEN Information Systems Co., Hua-Hsing Information Corp., Hyundai Electronics, Taiwan's Institute for Information Industry (III), Taiwan's Industrial Technology Research Institute (ITRI), Lite-ON Technology Corp., LG Electronics, Mitac Inc., Mitsubishi Electric Corp., Nestor Technology, Nokia, Omron Corporation, Oracle, Proton, Sun Microsystems Computer Company, Sun Moon Star, SunRiver Data Systems, Tatung Company, THOMSON-Sun Interactive Alliance, THOMSON multimedia S.A., Toshiba Corporation, UMAX, Visionetics Internationalities Technology and Xerox have stated their intent to license JavaOS.

Borland International, Corel Corporation, Dun & Bradstreet Software, Hugh Symon Group, Justsystems Corp., Metrowerks, SunSoft, Inc. and Symantec Corp., endorse JavaOS and intend to build tools or applications for the platform.

ARM Ltd., Cirrus Logic, Fujitsu Microelectronics Inc., LSI Logic, National Semiconductor, and Sun Microelectronics are among the companies that intend to implement JavaOS on their microprocessors. To date, JavaSoft expects JavaOS to be run on a broad variety of microprocessors, including ARM, CompactRISC, Intel X86, NS486, PowerPC, microJAVA, microSPARC, picoJAVA, SPARClite and others.

"We're having in depth discussions with companies who want to use JavaOS to create products that really push the envelope," said Mitchell. "Over the next twelve months we anticipate a broad range of product announcements based on JavaOS, including Internet and Intranet devices that will set a new standard for ease of installation and use in a networked environment."

Development Tools for JavaOS

JavaSoft is collaborating with leading tools developers to define open APIs, such as the JavaOS Debugging API, that they'll use to ensure their tools work seamlessly with JavaOS. Borland, Metrowerks, SunSoft and Symantec intend to adapt and

leveraging the expertise and volume market presence each of these companies has already developed in creating strong tools for the basic Java platform, and expect them to be able to deliver effective tools for JavaOS very rapidly."

JavaOS runs on industry microprocessors

In addition, JavaOS has been built to be fully ROMable for embedded applications, and can run with as little as 512K ROM and 256K RAM. For network computers, an entire system with JavaOS, the HotJava(TM) Browser and space for downloading Web content and applets requires only 3MB ROM and 4MB RAM. JavaOS can be this small because it is almost completely written in Java.

JavaSoft, headquartered in Cupertino, CA, is an operating company of Sun Microsystems Inc. The company's mission is to develop, market and support the Java technology and products based on it. Java supports networked applications and enables developers to write applications once that will run on any machine. JavaSoft develops applications, tools and systems platforms to further enhance Java as the programming standard for complex networks such as the Internet and corporate intranets.

JavaOne, the first JavaSoft-sponsored developers conference for Java, will take place May 29-31, 1996 at San Francisco's Moscone Center. JavaOne's keynote addresses will be webcast at http://java.sun.com/javaone, and all conference session materials will be available at the same url.

With annual revenues of more than $6 billion, Sun Microsystems, Inc. provides products and services that enable customers to build and maintain open network computing environments. Widely recognized as a proponent of open standards, the company is involved in the design, manufacture and sale of products, technologies and services for commercial and technical computing. Sun's SPARC(TM) workstations, multiprocessing servers, SPARC microprocessors, SolarisTM operating software and ISO-certified service organization each rank No. 1 in the UNIX® industry. Sun's Java(TM) platform-independent programming environment, provides a comprehensive solution to the challenge of programming for complex networks, including the Internet. Sun Microsystems was founded in 1982, and is headquartered in Mountain View, California.

PR Contacts for Press and Analysts:

JavaSoft
Lisa Poulson *(408) 343-1630* *http://java.sun.com*

Questions or comments regarding this service? *webmaster@sun.com*

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit M

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July 6, 2011

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HIGHLY CONFIDENTIAL – SOURCE CODE

Via E-Mail sweingaertner@kslaw.com

Scott T. Weingaertner
King & Spalding LLP
1185 Avenue of the Americas
New York, NY 10036-4003

Re: *Oracle America, Inc. v. Google Inc.*, Case No. 10-03561-WHA

Dear Scott:

In our preparations for trial, we have learned that Oracle's identification of JavaOS 1.0 as an embodiment of the '702 patent in Oracle's infringement contentions pursuant to Patent L.R. 3-1(g) was in error. The correct identification is JavaOS 1.1 and subsequent versions.

Patent L.R. 3-1(g) provides: "If a party claiming patent infringement wishes to preserve the right to rely, for any purpose, on the assertion that its own apparatus, product, device, process, method, act, or other instrumentality practices the claimed invention, the party shall identify, separately for each asserted claim, each such apparatus, product, device, process, method, act, or other instrumentality that incorporates or reflects that particular claim." Because JavaOS 1.0 was not an embodiment of the '702 patent, Oracle will not assert that it was in this litigation and need not preserve the right to do so.

The error has not affected the case in any significant way. JavaOS was not mentioned in Google's January 18, 2011 invalidity contentions, nor was it mentioned or charted in Google's proposed supplemental invalidity contentions.

I am available if you wish to discuss further.

Sincerely,

Marc David Peters

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit N

the requisite disclosure to prepare its own disclosures. If Oracle seeks and is granted permission to amend its Infringement Contentions, then Google specifically reserves the right to modify, amend, or supplement these Invalidity Contentions for that reason. Google also specifically reserves its right to modify, amend, or supplement these Invalidity Contentions for other reasons as provided by any applicable Rule or Order, including the Patent Local Rules.

Google believes that the references discussed in Section I.A each independently anticipate the Asserted Claim under 35 U.S.C. § 102 and/or alone render obvious the Asserted Claim under 35 U.S.C. § 103. To the extent that any one of the previously discussed anticipatory references is found not to anticipate one or more Asserted Claims, various references described herein and/or the knowledge and skill of a person of ordinary skill in the art at the time of the invention, in combination with any one of the anticipatory references, render the claim invalid as obvious. Google's contentions that the references in this section, in various combinations, render the Asserted Claims obvious under 35 U.S.C. § 103 are in no way an admission or suggestion that each reference does not independently anticipate a particular claim under 35 U.S.C. § 102.

Table 2. List of 35 U.S.C. § 103 Prior Art Combinations

Chart	**Prior Art Reference**	**Claims Rendered Obvious**
A-5	J.W. Davidson, "Cint: A RISC Interpreter for the C Programming Language," SIGPLAN '87 Papers of the Symposium on Interpreters and Interpretive Techniques, 1987, *in view of* AT&T, *System V Application Binary Interface Motorola 68000 Processor Family Supplement*, Prentice Hall Int'l, 1990. One of ordinary skill in the art at the time would have had motivation to combine these references at least because they both relate to the System V operating system.	'104 Patent, claims 11-41.
B-1	Palay, U.S. Patent No. *with* James Gosling, U.S. Patent No. 5,367,685 (issued Nov. 22, 1994). One of ordinary skill in the art at the time would	'702 Patent claim 16.

GOOGLE'S MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS

CIV. NO. CV 10-03561-WHA

Exhibit O

XP-002100907

Going Beyond the Sandbox: An Overview of the New Security Architecture in the Java™ Development Kit 1.2

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Abstract

This paper describes the new security architecture that has been implemented as part of JDK1.2, the forthcoming Java™ Development Kit. In going beyond the sandbox security model in the original release of Java, JDK1.2 provides fine-grained access control via an easily configurable security policy. Moreover, JDK1.2 introduces the concept of protection domain and a few related security primitives that help to make the underlying protection mechanism more robust.

1 Introduction

Since the inception of Java [8, 11], there has been strong and growing interest around the security of Java as well as new security issues raised by the deployment of Java. From a technology provider's point of view, Java security includes two aspects [6]:

- Provide Java (primarily through JDK) as a secure, ready-built platform on which to run Java enabled applications in a secure fashion.
- Provide security tools and services implemented in Java that enable a wider range of security-sensitive applications, for example, in the enterprise world.

This paper focuses on issues related to the first aspect, where the customers for such technologies include vendors that bundle or embed Java in their products (such as browsers and operating systems). It is worth emphasizing that this work by itself does not claim to break significant new ground in terms of the theory of computer security. Instead, it offers a real world example where well-known security principles [5, 12, 13, 16] are put into engineering practice to construct a practical and widely deployed secure system.

1.1 The Original Security Model

The original security model provided by Java is known as the sandbox model, which exists in order to provide a very restricted environment in which to run untrusted code (called applet) obtained from the open network. The essence of the sandbox model, as illustrated by Figure 1, is that local code is trusted to have full access to vital system resources (such as the file system) while downloaded remote code is not trusted and can access only the limited resources provided inside the sandbox.

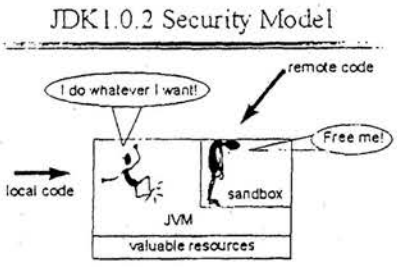

Figure 1: JDK1.0.x Security Model

This sandbox model is deployed through the Java Development Toolkit in versions 1.0.x, and is generally adopted by applications built with JDK, including Java-enabled web browsers.

Overall security is enforced through a number of mechanisms. First of all, the language is designed to be type-safe, and easy to use. The hope is that the burden on the programmer is such that it is less likely to make subtle mistakes, compared with using other programming languages such as C or C++. Language features such as automatic memory man-